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Bill Acceptor Series EBA-03 Bill Validator

*Operation and Maintenance Manual
(Revision 2)*



JCM Part No. 960-000058R_Rev. 2



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EBA-03 Bill Validator

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EBA-03 Bill Validator

Bill Acceptor Series

Section 1

1 GENERAL INFORMATION

This manual provides a general overview of the advantages and options of the European Bill Acceptor Validation Unit (EBA-03) pictured in Figure 1-1. This first section is designed to help you navigate through the manual with ease and provides the following information:

- Introduction
- Specifications
- Primary Component Parts
- Precautions
- Dimensions
- Country Codes.

In order to make operation of this device and make navigation within this manual easier, the following illustrations were used within the text:

- **Safety instructions**, which need to be observed in order to protect the operators and equipment, have been written in bold text and have been given the pictographs: 
- **Special Notes**, which effect the use of the Bill Validator, have been written in *italic* text and have been given the pictograph: 
- **Steps**, requiring the operator to perform specific actions are given sequential numbers (1., 2., 3., etc.).



Figure 1-1 EBA-03 Bill Validator

Introduction

The JCM EBA-03 Bill Validator head is designed for international platforms that accept currency 62mm to 72mm in width and allows lengthwise insertion in all four directions.

The EBA-03 contains:

- Custom Sensor Technology
- 2 Mb of EPROM Memory
- Denomination DIP Switch Selections
- Pulse or Serial Interface Capabilities
- Two Second Validation Speed
- Easy Access Serviceability
- CE Approval.

Specifications

Table 1-1 lists the EBA-03 General Specifications.

Table 1-1 General Specifications

Condition	Function
Acceptable denominations:	DIP Switch selectable
Insertion direction:	Four-way
Acceptance rate:	90+% in normal acceptance mode. (Exclusions would include bills containing contamination, having excessive wear, wet, or torn, and those with their corners or ends folded, dimensions altered or print significantly different than reference note.
Validation time:	Approximately two (2) seconds (Time from insertion to output of credit pulse or storage verification)
Power:	DC +12V ($\pm 5\%$)
Power consumption:	In standby: 2.5 VA In Operation: 6.0 VA (Max. 10 VA)
Operating environment:	Operating temperature: 5°C - 50°C (41°F - 122°F) Storage temperature: -20°C - 60°C (4°F - 140°F) Humidity: 30% - 85% RH (non-condensing) Light sensitivity: Must not be exposed to direct sunlight
Installation:	Indoors only
Dimensions:	See dimension drawings on Page 4 for further detail
Weight:	approximately 0.6 Kg (1.32 lb.)
Installation:	Horizontal

Primary Component Parts

Figure 1-2 illustrate the Primary Component Part names for the EBA-03.

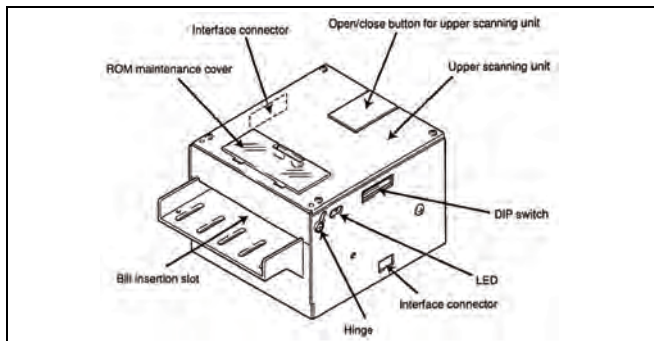


Figure 1-2 EBA-03 Primary Component Parts

Precautions

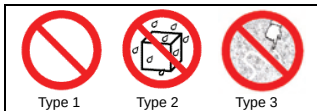


Figure 1-3 Precautionary Symbols

The Figure 1-3 symbols are defined as follows:

1. (Type 1) Do not insert a torn, folded, or wet bill, as this action may cause a bill jam inside the unit.

2. (Type 2) Do not expose the unit to water. The unit contains several precision electronic devices which can be damaged if water or any liquid is sprayed or spilled into the unit.
3. (Type 3) Do not install the unit into a dusty environment. Dust may affect the sensor's performance.

Dimensions

Figure 1-4 illustrates the typical EBA-03 external dimensions in millimeters.

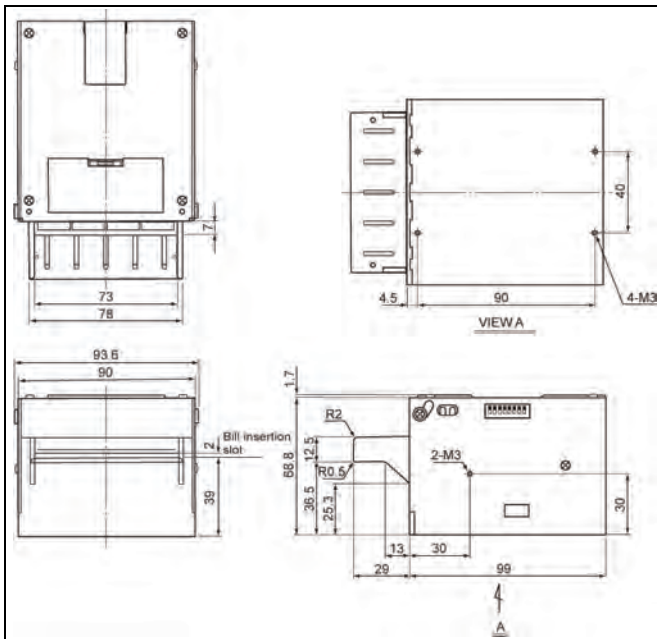


Figure 1-4 EBA-03 Bill Validator Dimensions

Country Codes

Table 1-1: Country Code Listings

Country	Country Code
Antilles	ANT
Argentina	ARG
Australia	AUS
Austria	AUT
Austria	AUT4
Barbados	BRB
Belgium	BEL
Botswana	BWA
Brazil	BRA
Bulgaria	BGR
Canada	CAN
Canada	CAN
Chile	CHL
China	CHN
Colombia	COL
Costa Rica	CRI
Croatia	HRV
Cyprus	CYP
Czech Republic	CZE
Denmark	DNK
Estonia	ESTE
Estonia	EST2
European Union	EUR
Finland	FIN
France	FRA
Germany	DEU
Germany	DEU1
Germany	DEU2
Germany/Sweden	DEU/SWE
Great Britain (England)	GBR
Great Britain (England)	GBR-B
Great Britain/Gibraltar	GBR/GBI
Great Britain/Isle Of Man	GBR/MAN
Greece	GRC
Greece	GRC-B
Guatemala	MGT
Honduras	HND
Hong Kong	HKG
Hungary	HUN

Table 1-1: Country Code Listings (Continued)

Country	Country Code
Iceland	ISL
India	IND
Israel	ISR
Italy	ITA
Italy	ITA8
Italy	ITA9
Japan	JPN
Kazakhstan	KAZ
Kazakhstan	KAZ1
Latvia	LVA
Lithuania	LTU
Malaysia	MYS
Malaysia	MYS1
Malta	MLT
Mauritius	MUS
Mexico	MEX
Moldova	MDA
Morocco	MAR
Namibia	NAM
Netherlands	NLD
Netherlands	NLD-B
New Zealand	NZL
New Zealand	NZL1
New Zealand	NZL-B
North Ireland	NIRL
Norway	NOR
Norway	NOR1
Peru	PER
Peru	PER1
Philippines	PHL
Philippines	PHL1
Poland	POL
Poland	POL1
Poland	POL1-B
Portugal	PRT
Qatar	QAT
Republic Of Ireland	IRL
Republic Of Korea	KOR
Republic Of Korea	KOR-B
Romania	ROM

Table 1-1: Country Code Listings (Continued)

Country	Country Code
Russia	RUS
Russia	RUS-B
Saudi Arabia	SAU
Singapore	SGP
Singapore	SGP-B
Slovakia	SVK
Slovenia	SVN
South Africa	ZAF
Spain	ESP
Sri Lanka	LKA
Sweden	SWE
Switzerland	CHE
Switzerland	CHE3
Switzerland	CHE-B
Taiwan (Republic Of China)	TWN
Tanzania	TZA
Thailand	THA
Trinidad & Tobago	TTO
Ukraine	UKR
Ukraine	UKR1
United Arab Emirates	ARE
United States	USA
Uruguay	URY
Uruguay	URY1
Venezuela	VEN
Venezuela	VEN1
Venezuela	VEN2
Venezuela	VEN-B

These Country Codes conform to the ISO 3166 Country Code list definitions.

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EBA-03 Bill Validator

Bill Acceptor Series

Section 2

2 INSTALLATION / OPERATION

This section provides installation and operation instructions for the EBA-03 Bill Validator. The information within contains the following features:

- Pin Assignments

- DIP Switch Settings
- Preventive Maintenance.

Figure 2-1 illustrates a typical EBA-03 system connection.

Connections

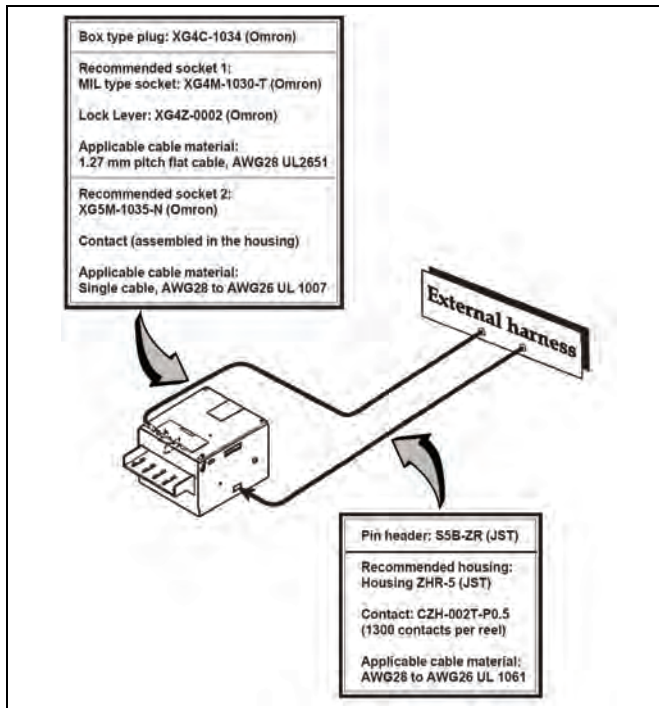


Figure 2-1 Typical EBA-03 System Connections

Pin Assignments

Table 2-1 Serial I/F (ID-044C) Pins Assignments

Pin Signal No.	Signal Name	I/O	Active	Description
1	Vdd			Power supply 12V ($\pm 5\%$)
2	Vss			GND
3	DATA	Output	Low	The output terminal for communications data
4	CTS	Input	Low	The transmission authorization signal for communication data
5	Vss			GND
6	Vcc			Power supply 5V ($\pm 5\%$) MAX 20mA
7	BUSY	Output	Low	The output signal indicating the validator is functional
8	DISABLE/ ENABLE	Input	Low	The signal for disabling (High) and enabling (Low) the registering of bills
9	RTS	Output	Low	The signal for confirming the commencement of communications data
10	NC			

Table 2-2 Pulse I/F (ID-044C) Pins Assignments

Pin No.	Signal Name	I/O	Active	Description
1	Vdd			Power supply 12V ($\pm 5\%$)
2	Vss			GND
3	VEND	Output	Low	Registered bill type signal (pulse signal)
4	NC			
5	Vss			GND
6	Vcc			Power supply 5V ($\pm 5\%$) MAX 20mA
7	BUSY	Output	Low	The output signal indicating the validator is functional
8	DISABLE/ ENABLE	Input	Low	The signal for disabling (High) and enabling (Low) the registering of bills
9	NC			
10	NC			

Table 2-3 Bi-directional Serial I/F (ID-003) Pin Assignments

CPU Board  CN1				
Pin No.	Signal Name	I/O	Active	Description
1	Vdd			Power supply 12V ($\pm 5\%$)
2	Vss			GND
3	TXD	Input		Output signal line from acceptor
4	RXD	Output		Output signal line from controller
5	Vss			GND
6	Vcc	Output		Power supply 5V ($\pm 5\%$) MAX 20mA
7	NC			Leave unconnected
8	NC			Leave unconnected
9	NC			Leave unconnected
10	NC			Leave unconnected

Table 2-4 Pulse I/F (ID-003) Pin Assignments

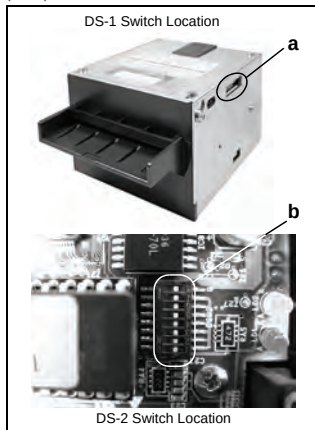
Pin No.	Signal Name	I/O	Active	Description
1	Vdd	Input		Power supply 12V ($\pm 5\%$)
2	Vss			GND
3	VEND	Output	Low	Bill acceptance denomination signal
4	NC			Leave unconnected
5	Vss			GND
6	Vcc	Output		Power supply 5V ($\pm 5\%$) MAX 20mA
7	BUSY	Output	High	Output signal when validator is functional
8	INH	Input	High	Bill acceptance inhibition signal*
9	ABN	Input	High	Output signal when validator is abnormal
10	NC			Leave unconnected

* When an INH signal is not connected, the acceptor is in a bill acceptance inhibition mode.

When an INH signal is not used, connect pin 8 to Vss.

DIP Switch Settings

The EBA-03 has two sets of DIP Switches. One is located on the right side of the acceptor (See Figure 2-2 a), designated DIP Switch Block 1 (DS-1), the other is inside the EPROM cover (See Figure 2-2 b), designated DIP Switch Block 2 (DS-2).

**Figure 2-2** Various DIP Switch Locations

DIP Switch Block 1 (DS-1) is used to accept or inhibit denominations. DIP Switch Block 2 (DS-2) is used to select the interface (I/F) and set details of the interface signals.

DS-2 can be accessed by removing the EPROM cover. These DIP Switches are used to set serial or pulse interface, and establish signal parameters if the Pulse Interface is used.



Caution: Make all DIP Switch settings with the power to the EBA-03 turned OFF!

Table 2-5 DIP Switch 1 (DS-1) Settings

DIP Switch No.	Position		Denomination (see NOTE below)*	Accept/ Reject
	ON	OFF		
1	X		1	Accept
		X		Reject
2	X		2	Accept
		X		Reject
3	X		3	Accept
		X		Reject
4	X		4	Accept
		X		Reject
5	X		5	Accept
		X		Reject
6	X		6	Accept
		X		Reject



NOTE: Turn DS-1, Switch #1 ON to enter the test mode.

Table 2-5 DIP Switch 1 (DS-1) Settings

 NOTE: Turn DS-1, Switch #1 ON to enter the test mode.			
DIP Switch No.	Position		Accept/Reject
	ON	OFF	
8	X		Accept
		X	Reject
		7	

*NOTE: Numbers 1-7 indicate different denominations in any currency.

Figure 2-3 illustrates the internal DS-2 DIP Switch settings when the Serial Interface (I/F), or the Pulse Interface is configured.



When serial I/F is used, set DS-2, Switch #1 to ON.



When pulse I/F is used, set DS-2, Switch #1 to OFF

- DS-2 Switches #2 and #3 determine the pulse width
- DS-2 Switch #4 selects the pulse option
- DS-2 Switch #5 controls the exit sensor:
 - ON = Disabled,
 - OFF = Enabled (Normal operation)
- DS-2 Switch #6 controls the INHIBIT signal:
 - OFF = high active,
 - ON = low active
- DS-2 Switch #7 controls the ABN signal:
 - OFF = high active,
 - ON = low active
- DS-2 Switch #8 controls the ACCEPTANCE rate:
 - ON = high acceptance,
 - OFF = low acceptance

NOTE: These settings vary according to the software version

Figure 2-3 DIP Switch 2 (DS-2) Settings

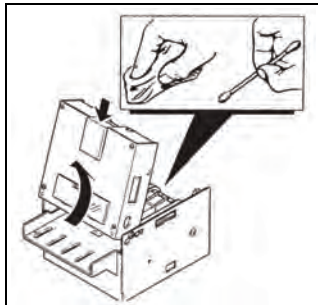
Preventive Maintenance

It is important to keep the bill path, rollers, and belts clean. The sensor lenses are transparent surfaces, and are made of a polymer material. Handle them with extreme care.

To clean the lenses, use a lint-free cloth and mild non-abrasive detergent such as liquid dish soap mixed with water (See Figure 2-4).



WARNING: Do not use alcohol or paint thinner for cleaning surfaces!

**Figure 2-4 EBA Bill Path Cleaning**

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Bill Acceptor Series

Section 3

3 DISASSEMBLY / REASSEMBLY

This section provides disassembly and reassembly instructions for the EBA-03 Bill Validator. The information within contains the following features:

- Disassembly Procedure
- Reassembly Procedure

Disassembly Procedure

To correctly disassemble an EBA-03 unit, perform the following steps:

1. Remove the screws and collars from the hinge openings on both sides of the unit (See Figure 3-1 a), then
2. Remove the body cover retaining screw from each side of the unit, and detach each body cover (See Figure 3-1 b).



Figure 3-1 Screw, Collar and Cover Removal

3. Lift the body out of the frame (See Figure 3-2).



Figure 3-2 Frame Removal

4. Remove the four screws securing the CPU Cover, and remove the cover (See Figure 3-3).

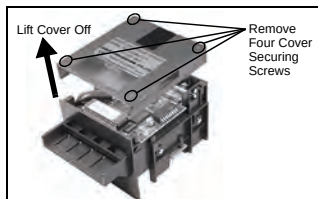


Figure 3-3 CPU Board Cover Removal

5. Remove Connector CN3 that connects to a Transistor mounted on the CPU Board Cover.
6. Release the two springs securing the horizontal rod in place, and slide the rod out (See Figure 3-4).

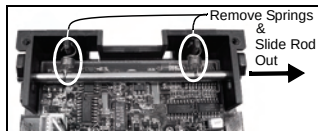


Figure 3-4 Rod Removal

7. Disconnect the 30-pin CPU Board connector (See Figure 3-5 a), then
8. Remove the three (3) circuit board mounting screws indicated in the Figure 3-5 b photo.

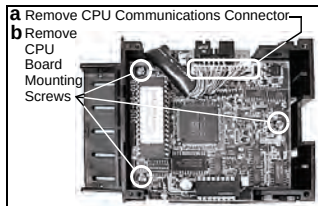


Figure 3-5 Freeing the CPU Board

9. Lift the upper circuit board up and out of the frame (See Figure 3-6).

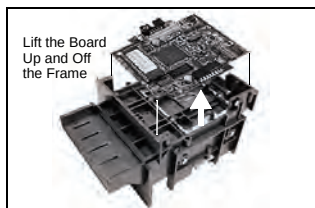


Figure 3-6 CPU Board Removal

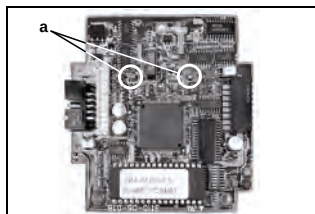


Figure 3-7 Sensor Cover Screw Removal

10. Remove the Sensor Cover by removing the two retaining screws shown in Figure 3-7 a.
11. Remove the Lower Sensor Board by disconnecting the 30-pin board connector (See Figure 3-8 a), and the 2-pin connector coming from the motor (See Figure 3-8 b).
12. Remove the two (2) screws shown in Figure 3-8 c.

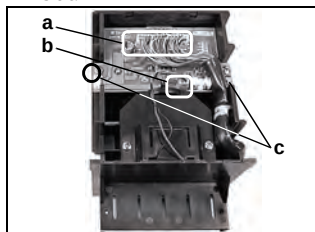


Figure 3-8 Freeing the Lower Sensor Board

13. Remove the Lower Sensor Board Cover by removing four (4) circuit board retaining screws (See Figure 3-9 a).

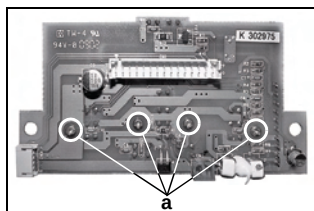


Figure 3-9 Lower Sensor Board Cover Removal

14. Remove the two screws securing the motor cover from the lower assembly and remove the motor, gears and drive belts from the assembly (See Figure 3-10 a).

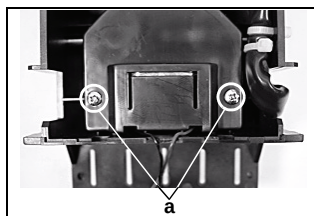


Figure 3-10 Motor Cover Removal

15. Lift the motor up and out of the frame (See Figure 3-11).

CAUTION: There is a small, white ball bearing located in a cup at the end of the drive shaft that could fall out when the motor is removed. Carefully remove it, and store it in a safe place for reassembly.

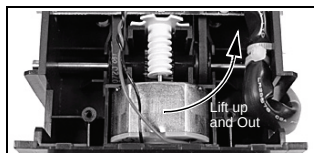


Figure 3-11 Motor Removal

Reassembly Procedure

To reassemble, reverse the preceding procedure.

EBA-03 Bill Validator

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Section 4

4 CALIBRATION

Connecting a PC for Calibration

Figure 4-1 illustrates the required equipment inter-connection necessary to properly calibrate the EBA-03 unit.

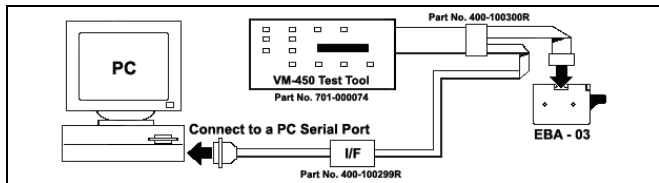


Figure 4-1 EBA-03 Test Setup

Figure 4-2 illustrates the required tools necessary to properly calibrate the EBA-03 unit.

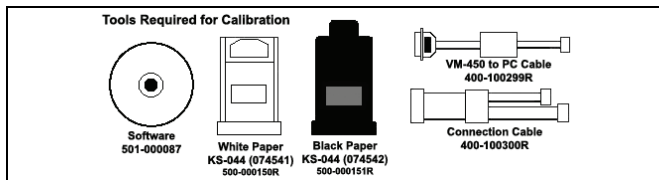


Figure 4-2 EBA-03 Test Tool Requirements

VM-450 and EBA-03 DIP Switch Settings

Figure 4-3 illustrates the VM-450 and the EBA-03 proper test DIP Switch settings.



Figure 4-3 VM-450 and EBA-03 DIP Switches

When power is applied to the VM-450, the Red and Green LEDs on the EBA-03 will light. This means the unit is in Standby Mode. Tests and adjustments are performed in this mode.

If the LEDs fail to light, recheck the DIP Switch settings. Turn power to the VM-450 OFF, then turn it back ON. If the LEDs still do not light, check the ROM and CPU Board's integrity.

Installing the Calibration Software

1. Place the EBA-03 calibration software CD into your CD drive. Wait a few seconds, and the first screen shown in Figure 4-4 will appear.
2. Once the files are copied, the second screen shown in Figure 4-5 will appear.

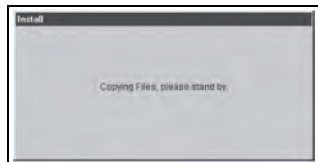


Figure 4-4 Initial Software Install Screen

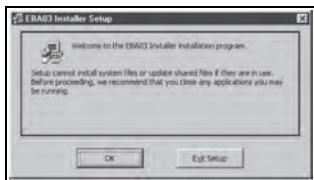


Figure 4-5 Second Software Install Screen

- Click the **OK** Screen Button to continue the installation.
- To complete the software installation on your hard drive, click the large icon shown in Figure 4-6 and follow the screen prompts.

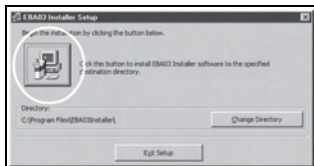


Figure 4-6 Third Software Install Screen

Using the Calibration Software

With the cabling attached as shown in the Figure 4-1 illustration, begin the tests by:

- Double-click on the EBA-03 icon. The opening screen shown in Figure 4-7 will appear. Click **Start** and follow the on-screen instructions.

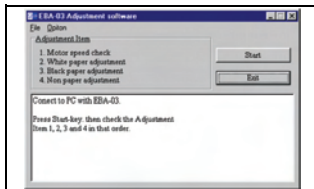


Figure 4-7 Initial Adjustment Software Screen

- Once the motor speed test is finished, open the top of the Acceptor and insert the White Reference Paper (Part No. 074541) into the insertion slot.

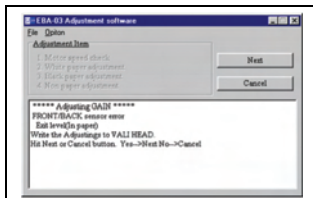


Figure 4-8 Final Adjustment Software Screen

- Then click on the **Next** Screen Button. When that test is finished, replace the White Reference Paper with the Black Reference Paper (Part No. 074542).

NOTE: This test only takes a second. Remove the Black Reference Paper and click "Next" again.

If there is a calibration problem, an ERROR message will appear in Figure 4-8 indicating where the possible problem location could be.

Sensor Names and Locations

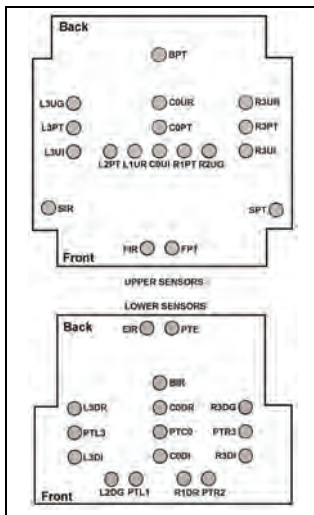
If an error does occur during the previous tests, use the error information listed in Table 4-1 and the location information shown in Figure 4-9 to determine which sensor may be at fault and where that particular sensor is located.

Table 4-1 Error Codes

Error Name	Sensor Name
I3t_ir	L3DI/L3PT
I3t_gn	L3UG/PTL3
I3d_ir	L3DI
I3d_rd	L3DR
I3u_ir	L3UI
I3u_gn	L3UG
c0t_ir	C0DI/C0PT
c0t_rd	C0UR/PTC0
c0d_IR	C0DI
c0d_rd	C0DR
c0u_ir	C0UI
c0u_rd	C0UR
r3t_ir	R3DI/R3PT
r3t_rd	R3UR/PTR3
r3d_ir	R3DI
r3d_gn	R3DG

Table 4-1 Error Codes (Continued)

Error Name	Sensor Name
r3u_ir	R3UI
r3u_rd	R3UR
l1t_rd	L1UR/PTL1
r1t_rd	R1DR/R1PT
l2t_gn	L2DG/L2PT
r2t_gn	R2UG/PTR2
b0t_ir	BIR/BPT
f0t_ir	FIR/FPT
e0t_ir	EIR/PTE
s0t_ir	SIR/SPT

**Figure 4-9** Sensor Locations

Refer to Appendix A for additional sensor troubleshooting procedures.

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EBA-03 Bill Validator

Bill Acceptor Series

Section 5

5 EXPLODED VIEW AND PARTS LIST

This section provides exploded view and associated parts lists for the EBA-03 Bill Validator.

EBA-03 Exploded View

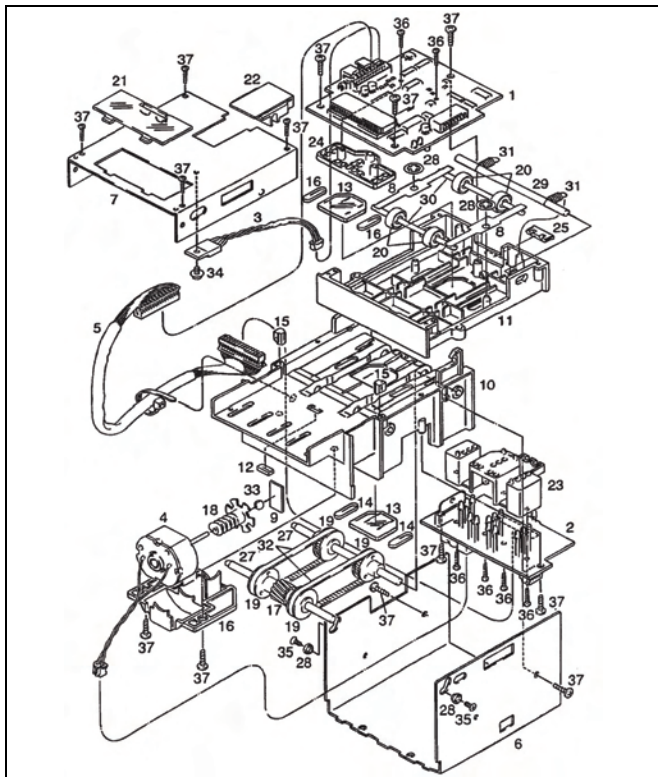


Figure 5-1 EBA-03 Exploded View

EBA-03 Parts List**Table 5-1 EBA-03 Parts List**

No.	EDP No.	Part No.	Description	Qty.	Remarks
1	067383	659-3110-06-01B-02	CPU Board Assy.	1	
2	067382	659-3110-06-02B-01	Sensor Board Assy.	1	
3	067412	659-3110-05-01A-01	Regulator Module Assy.	1	
4	067416	659-3110-05-02A-01	DC Motor Module Assy.	1	
5	067489	3110-05-03B	Relay Harness	1	
6	067478	0659PT0101	Frame Lower	1	
7	067479	0659PT0102	Frame Upper	1	
8	067480	0659PT0103	Plate Spring	2	
9	067481	0659PT0104	Mirror	1	
10	069760	0659RE0101	Bill Guide Lower	1	
11	069761	0659RE0102	Bill Guide Upper	1	
12	067464	0659RE0103	Square Prism	1	
13	067467	0659RE0104	Window Cover A	2	
14	067468	0659RE0105	Window Cover B	4	
15	067469	0659RE0106	Prism Wall	2	
16	067470	0659RE0107	Motor Cover	1	
17	067471	0659RE0108	Worm Wheel G7	1	
18	067472	0659RE0109	Worm Gear G7	1	
19	067473	0659RE0110	Pulley GT2	4	
20	067474	0659RE0111	Drive Roller	4	
21	067465	0659RE0112	ROM Cover Wide	1	
22	067476	0659RE0113	Open Button	1	
23	067477	0659RE0114	Sensor Spacer A	1	
24	069492	0659RE0115	Sensor B Spacer	1	
25	069491	0659RE0116	Square Prism 2	1	
26	069493	0659RE0117	Window Cover C	2	
27	067482	0659BE0101	Pulley Beam	2	
28	067483	0659C00101	Fulcrum Collar	2	
29	067484	0659SH0101	Open Shaft	1	
30	067485	0659SH0102	Roller Shaft	2	
31	067486	0659TS0101	Open Spring	2	
32	067487	166-2GT-3RF	Timing Belt	2	
33	069519	Φ5	Nylon Ball	1	
34	069762	M2.3 x 4	SEMS	1	
35	005846	M2.6 x 5	Flat-head Screw	2	
36	062887	Nominal 2 x 10	P-tight Pot Screw	6	
37	061502	Nominal 2.6 x 10	P-tight Bind Screw	13	
38	047547	Nominal 4	CA Snap Ring for Shaft	2	

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Section 6

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EBA-03 Bill Validator

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Section A

A TROUBLESHOOTING

This section provides troubleshooting instructions for the EBA-03 Bill Validator. The information within contains the following features:

- Removing a Jammed Bill
- Performance Tests
- Test DIP Switch Settings
- Troubleshooting Using VM-450 Tests
- Error Codes

Removing a Jammed Bill

To remove a jammed bill:

1. Push the Open/Close Button located on the upper scanning unit forward and lift the unit up (See Figure A-1)



CAUTION: Do not raise the upper scanning unit up too high. Doing so could damage the wiring harness.

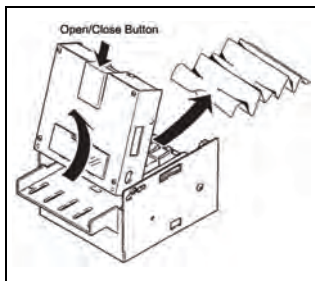


Figure A-1 Opening the EBA Bill Path

2. Remove the jammed bill.

Performance Tests

Perform the following steps to initiate an EBA performance test:

1. Connect the EBA-03 to the VM-450 with short ribbon cable Part No. 074744 (See Figure A-2).

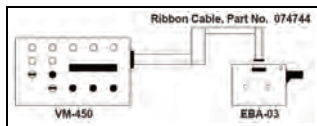


Figure A-2 Connecting the Ribbon Cable

2. Connect the AC Power Cord supplied in the kit to the VM-450 to a suitable power source.
3. Position the VM-450 and EBA-03 DS-1 DIP Switches as shown in Figure A-3.



Figure A-3 VM-450 & EBA-03 DIP Switch Settings

4. Apply power to the VM-450. The STKF and BSY LEDs on the VM-450 and the EBA-03 Red and Green LED's will all light.

Troubleshooting Using VM-450 Tests

The tests listed in Table A-1 are performed using DS-1, DIP Switches #2 through #8 located on the right side of the EBA-03. DIP Switch #1 is used to toggle the test on and off.



NOTE: OFF starts a test; ON stops the test and puts the unit into standby mode awaiting the start of the next test.

Table A-1 EBA DS-1 DIP Switch Tests

DIP Switch 1 2 3 4 5 6 7 8	Test Item	Description
	Forward motor rotation	Checks motor speed in a forward rotation
	Reverse motor rotation	Checks motor speed in a reverse rotation
	Sensor ON/OFF	Checks sensor status*
	Acceptor I/F test	Checks input/output signal line status
	Performance test	Checks acceptor operation*
	Bill acceptance*	Checks bill identification and acceptance*

*.NOTE: This test is effective only after performing a full EBA-03 calibration procedure (See "Calibration" on page 4-1 of Section 4).

TEST NO. 1 TRANSPORT MOTOR FORWARD ROTATION TEST

The first test is the motor speed test in a forward direction.

1. Set the initial DIP Switches according to the Figure A-4 illustration.
2. With the power turned off to the VM-450, set DS-1, Switch #1 to the ON position.



Figure A-4 Transport Motor Forward Rotation Test DIP Switch Settings

3. Turn on the VM-450 power. The BSY and STKF lights will come on.
4. Put DS-1, Switch #1 in the OFF position. The BSY light will go out. The motor will rotate in a forward direction. One of three lights on the VM-450 will indicate the motor speed (See Figure A-5).

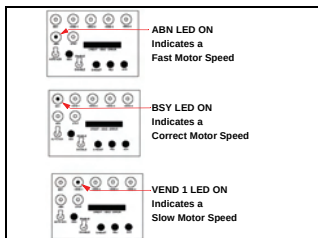


Figure A-5 EBA Test #1 & 2 LED Indications

TEST NO. 2 TRANSPORT MOTOR REVERSE ROTATION TEST

The next test is the motor speed test in a reverse direction.

1. With the VM-450 power turned OFF, set DS-1 Switch #1 ON and apply power.
2. Set DS-1, Switch #2 to the ON position as shown in Figure A-6.



Figure A-6 Transport Motor Reverse Rotation Test DIP Switch Settings

3. Turn DS-1, Switch #1 OFF. The BSY light will go out, and the motor will rotate in the reverse direction. One of the three previously

described lights on the VM-450 will indicate the motor speed rate (Review Figure A-5).

TEST NO. 3 ACCEPTOR SENSOR TEST

This test checks the acceptor head sensors status.



CAUTION: Do not attempt this test using a currency note! It is recommended that the test be performed with the special White Paper normally used to calibrate the sensors.

Set the initial DIP Switches according to the Figure A-7 illustration.



Figure A-7 Acceptor Sensor Test DIP Switch Settings

1. Turn off power to the VM-450.
2. Turn DS-1, Switches #1 and #3 ON.
3. Turn the power to the VM-450 ON.
4. Turn DS-1, Switch #1 OFF to begin running the tests.
5. Slowly slide the White Test Paper into the Acceptor while following the steps listed in Figure A-8.

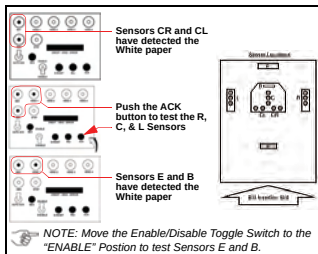


Figure A-8 EBA Test #3 Lit LED Indications



NOTE: The Red STKF light will be lit (ON) during the tests.

When the White Paper is inserted into the bill insertion slot, the "F" Sensor shown in Figure A-9 is the first to detect it. This detection will turn the VEND 1 LED ON. As the White Paper is inserted farther into the Acceptor Head, the remaining sensors will also detect its travel, and the appropriate LEDs on the VM-450 will sequentially light (See Figure A-9).

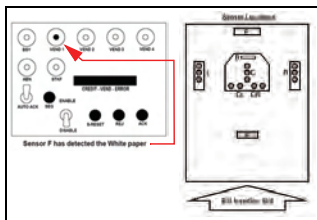


Figure A-9 Sensor "F" Detection Lit LED

TEST NO. 4 ACCEPTOR I/F TEST

This test checks the Acceptor's Input/Output signal line status. Use the ACK, REJ, and ENABLE buttons on the VM-450 to make sure the signal line is working as follows:

1. Set the initial DIP Switches according the Figure A-10 illustration.



Figure A-10 Acceptor I/F Test DIP Switch Settings

2. Turn off power to the VM-450.
3. Set DS-1, Switches #1, #2, and #3 to ON.
4. Turn power to the VM-450 ON, and change DS-1, Switch #1 to OFF to begin running the tests listed in the Figure A-11 procedure.

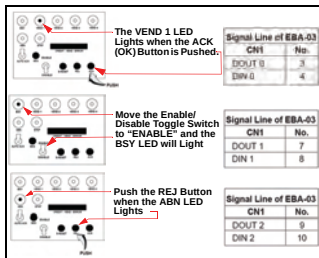


Figure A-11 EBA Test #4 Lit LED Indications

TEST NO. 5 ACCEPTOR FUNCTION TEST

This test performs a continuous unit cycling until an error occurs.

1. Set the initial DIP Switches according to the Figure A-12 illustration.



Figure A-12 Acceptor Function Test DIP Switch Settings

2. Turn off power to the VM-450.
3. Set DS-1, Switches #1, #2, #3, and #4 ON.
4. Turn on power to the VM-450 and change DS-1, Switch #1 to OFF to begin running the tests.

If an error occurs during the test operation, the ABN LED on the VM-450 will light and the test operation will stop.

The Red LED on the CPU board will begin blinking in flashing sets. The cause of the problem can be determined by counting the number of flashes between each pause. (See "Error Codes" on page A-24).

TEST NO. 6 BILL ACCEPTOR TEST

This test performs a bill acceptance test of the systems sensors.

1. Set the initial DIP Switches according to the Figure A-13 illustration.



Figure A-13 Bill Acceptance Test DIP Switch Settings

2. Turn off power to the VM-450.
3. Set DS-1, Switch #1, #2, and #5 ON.
4. Turn on power to the VM-450 and change DS-1, Switch #1 to OFF to begin running the tests.



NOTE: When performing this test, the Acceptor will not return to the test standby mode if you turn DS-1, Switch #1 to ON again. It is necessary to power off the unit, place DS-1, Switch #1 in the ON position, and then reapply power.

When a Bill is accepted the VM-450 and Vend 1 LED will blink rapidly three (3) times.

If a Bill is not accepted or rejected, refer to the Red and Green LEDs located on the EBA-03 for the Error Code generated as listed in Table A-2 and Table A-3 on this page.

If the Acceptor does not accept a bill, count how many times the Red LED flashes to determine the possible malfunctions requiring correction (See Table A-2 in Error Codes on this page).

If the Acceptor rejects a bill, count how many times the Green LED flashes to determine the possible malfunctions requiring correction (See Table A-3 in Error Codes on this page).

Error Codes

If the EBA-03 does not operate properly during the various tests, the Red and Green LED's on the CPU board will flash. Count the number of Red flashes and refer to the Error Code listing in Table A-2 to determine the possible cause of the problem, or count the number of Green flashes and refer to the Rejection Code listing in Table A-3 to determine the possible cause of the problem.

Table A-2 Red LED Error Codes

No. of Red LED Flashes	Error Description
1	Reserved
2	Reserved
3	Reserved
4	A bill has stopped in the bill path
5	Acceptor motor speed error Acceptor Sensor out of adjustment
6	Acceptor motor does not rotate Acceptor Sensor malfunction No signal from the Encoder Sensor
7	Reserved
8	Reserved
9	Reserved
10	Reserved
11	Reserved
12	Timing error (Tampering)

Table A-3 Green LED Rejection Codes

No. of Green LED Flashes	Error Description
1	Crooked Bill Insertion
2	Reserved
3	Bill Jam
4	Optical sensor error 1 (Bill size error)
5	Bill feed error
6	Identification error 1 (Near error)
7	Optical sensor error 2 (Pattern error)
8	Optical sensor error 3 (Photo level error)
9	Unacceptable bill returned (Inhibit error)
10	Reject signal input
11	Reserved
12	Back sensor error
13	Bill length error
14	Optical sensor error 4 (Infrared error)
15	Optical sensor error 5 (Unrecognizable bill)

EBA-03 Bill Validator

Bill Acceptor Series

Appendix B

B GLOSSARY

A

- 1 **ABN** – acronym for Abnormal.
- 2 **Acceptor** – a term used in Communications Section 3 referencing functions sent to, and received from the Coin Acceptor by software commands.

C

- 3 **ACK** – abbreviation for Acknowledge.
- 4 **Country Codes** – specific codes given to a country to identify its currency type.
- 5 **CPU** – acronym for Central Processing Unit.
- 6 **CPU Board** – a printed circuit board located at the top of the EBA's transport section.

D

- 7 **DIP Switch Block** – Dual Inline Package Switch Block – a printed circuit board mountable two-position slide switch package containing up to 16 individual switches.

E

- 8 **EBA** – acronym for European Bill Acceptor.
- 9 **EPROM** – acronym for Electrically Programmable Read Only Memory.

L

- 10 **LEDs** – acronym for Light Emitting Diodes.

N

- 11 **Non-abrasive Detergent** – a cleaning agent that contains no abrasive components and is as mild as common liquid dish soap.

P

- 12 **Pictographs** – small internationally recognized safety and attention symbols placed to the left of Notes, Cautions and Warnings throughout the manual.
- 13 **Polymer Material** – a soft plastic used to cover the sensor lenses.

R

- 14 **REJ** – abbreviation for Reject.

S

- 15 **Sensor** – a photo sensitive device and LED combination designed to detect timing and movement events.
- 16 **STKF** – acronym for Stack, Front

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